

HP StorageWorks

4000/6000/8000 Enterprise Virtual Array connectivity for HP-UX installation and reference guide

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About this guide

This installation and reference guide provides information to help you:

- Connect your host to an Enterprise Virtual Array storage system
- Get pointers to the latest layered applications used with the Enterprise Virtual Array

“About this guide” topics include:

- [Overview](#)
- [Getting help](#)
- [Conventions](#)

Overview

- [Intended audience](#)
- [Related documentation](#)

Intended audience

This book is intended for use by storage administrators who are experienced with the following:

- Host environments, such as Windows® 2000, Windows NT® , Windows Server 2003, Sun Solaris, OpenVMS, Tru64 UNIX®, HP-UX, IBM AIX, Linux®, Novell NetWare
- Enterprise Virtual Array (4000/6000/8000) storage systems

Related documentation

In addition to this guide, HP provides the following corresponding information:

- *HP StorageWorks 4000/6000/8000 Enterprise Virtual Array connectivity for HP-UX release notes*
- *HP StorageWorks Storage System Scripting utility reference*
- *HP StorageWorks Interactive Help for Command View EVA*

Conventions

Conventions consist of the following:

- [Document conventions](#)
- [Text symbols](#)

Document conventions

This document follows the conventions in [Table 1](#).

Table 1 Document conventions

| Convention | Element |
|--|--|
| Medium blue text: Figure 1 | Cross-reference links and e-mail |
| Medium blue, underlined text (http://www.hp.com) | Web site addresses |
| Bold font | <ul style="list-style-type: none">• Key names• Text typed into a GUI element, such as into a box• GUI elements that are clicked or selected, such as menu and list items, buttons, and check boxes |
| <i>Italics font</i> | Text emphasis |
| Monospace font | <ul style="list-style-type: none">• File and directory names• System output• Code• Text typed at the command-line |
| <i>Monospace, italic font</i> | <ul style="list-style-type: none">• Code variables• Command-line variables |
| Monospace, bold font | Emphasis of file and directory names, system output, code, and text typed at the command line |

Text symbols

The following symbols may be found in the text of this guide. They have the following meanings:



CAUTION:

Text set off in this manner indicates that failure to follow directions could result in damage to equipment or data.



NOTE:

Text set off in this manner presents commentary, sidelights, or interesting points of information.

Getting help

If you still have a question after reading this guide, contact an HP authorized service provider or access our web site: <http://www.hp.com>.

HP technical support

Telephone numbers for worldwide technical support are listed on the following HP web site: <http://www.hp.com/support/>. From this web site, select the country of origin.



NOTE:

For continuous quality improvement, calls may be recorded or monitored.

Be sure to have the following information available before calling:

- Technical support registration number (if applicable)
- Product serial numbers
- Product model names and numbers
- Applicable error messages
- Operating system type and revision level
- Detailed, specific questions

HP Storage web site

The HP web site has the latest information on this product, as well as the latest drivers. Access storage at: <http://www.hp.com/country/us/eng/prodserv/storage.html>. From this web site, select the appropriate product or solution.

HP authorized reseller

For the name of your nearest HP authorized reseller:

- In the United States, call 1-800-345-1518.
- In Canada, call 1-800-263-5868.
- Elsewhere, see the HP web site for locations and telephone numbers: <http://www.hp.com>.

1 Host connectivity

This chapter provides host connectivity information and links to components you need to support your operating system with an Enterprise Virtual Array storage system. It is important that you use the topics in this chapter in the following order:

- Installing the Fibre Channel adapter
- Downloading Fibre Channel adapter firmware
- Operating system multipathing
- Using the Storage System Scripting utility
- Working with clusters

Installing the Fibre Channel adapter

Supported Fibre Channel adapters must be installed in the host server in order to communicate with the Enterprise Virtual Array.



NOTE:

Traditionally, the adapter used to connect the host server to the fabric is called a host bus adapter (HBA). The server HBA used with the Enterprise Virtual Array is called a Fibre Channel adapter (FCA). You may also see the adapter referred to as a Fibre Channel host bus adapter (FC HBA) in other related documents.

Follow the hardware installation rules and conventions for your server type. The Fibre Channel adapter is shipped with its own documentation for installation. Refer to that documentation for complete instructions.

You need the following items to begin:

- FCA boards and the installation instructions included in the adapter kit
- The server's hardware manual for instructions on installing adapters
- Appropriate tools to service your server

The FCA board plugs into a standard PCI slot in the host server. Refer to the hardware manual for instructions on plugging in boards.

Downloading Fibre Channel adapter firmware

Supported Fibre Channel adapters (FCAs) must be installed in the host server in order to communicate with the Enterprise Virtual Array. You can download the latest version of the Fibre Channel adapter firmware at the following web site:

<http://h18006.www1.hp.com/storage/saninfrastructure.html>.

Refer to the host-specific release notes for a list of supported Fibre Channel adapters.

Operating system multipathing

Secure Path provides a multiple-path environment for your operating system. More information about Secure Path is available the following web site:

<http://h18006.www1.hp.com/products/sanworks/secure-path/index.html>.

You have the option of other native multipathing functionality. See the HP StorageWorks 4000/6000/8000 Enterprise Virtual Array connectivity for HP-UX release notes for additional information.

HP StorageWorks Command View EVA and the Storage System Scripting utility

The Storage System Scripting utility (SSSU) is delivered as part of HP StorageWorks Command View EVA. The SSSU is a command line interface (CLI) that issues commands directly to the controller. You can locate HP StorageWorks Command View EVA including the SSSU at the following web site: <http://h18006.www1.hp.com/products/storage/software/cmdvieweva/index.html>.

Working with clusters

Clustering is connecting two or more computers together in such a way that they behave like a single computer. Clustering is used for parallel processing, load balancing, and fault tolerance.

The supported clustering software for HP-UX is MC/Service Guard. See the operating system-specific release notes for the latest version of the supported clustering software.

Be sure to install operating system-specific FCAs on each server in the cluster. Refer to the documentation that came with the clustering software for more specific information.

2 Testing connections to the Enterprise Virtual Array

This chapter describes how to test connections between the operating system host server and the Enterprise Virtual Array. Virtual disks are set up and presented to your host server in order to test the connectivity and to begin using the disks. Topics in this chapter include the following:

- Adding hosts
- Creating and presenting virtual disks
- Verifying virtual disks from the host
- Configuring virtual disks from the host

Adding hosts

You can add a host using Command View EVA. You need to add each FCA installed in the host system in order for the host to work with the Enterprise Virtual Array by performing the following procedure:

1. Collect information on World Wide Names (WWNs) for each FCA on your server. You need this information when choosing the host FCAs in Command View EVA.



NOTE:

Adding hosts through the Command view EVA software consists of adding each FCA adapter installed in the host. When you add the first adapter, you use the Add Host function, but when you add subsequent adapters, you use the Add Port function. Ensure that you add a port for each active FCA.

2. Add the host using Command View EVA.
3. Ensure that the host FCAs have been added by inspecting the Host folder in the Navigation tree of Command View EVA.



NOTE:

For more information on using Command View EVA, refer to *HP StorageWorks Interactive Help for Command View EVA*.

Creating and presenting virtual disks

Use the following procedure to create and present additional virtual disks to the host servers:

1. Create a virtual disk on the Enterprise Virtual Array using Command View EVA.
2. Set values for the following parameters:
 - Virtual disk name
 - Vraid level
 - Size
 - Present to host (the host you just created)

3. Select a LUN number if you chose a specific LUN on the Virtual Disk Properties page.
4. Rescan the bus.

Verifying virtual disks from the host

This section describes how to verify that operating system hosts can access the virtual disks created on the Enterprise Virtual Array with Command View EVA. The host can recognize Enterprise Virtual Array devices either through a system restart or by rescanning the bus.

Scanning the bus

Use the following procedure to scan the bus and display information about the Enterprise Virtual Array devices:

1. Start the rescan of the FCA by using `ioscan`. For example:

```
# ioscan -fnCdisk
```

All new virtual disks become visible to the host.
2. Assign device special files to the new virtual disks with `insf`. For example:

```
# insf -e
```

Uppercase "E" reassigns device special files to all devices. Lowercase "e" assigns device special files only to the new devices—in this case, the virtual disks.



NOTE:

If it is the first time the virtual disk LUN is presented to the host, you may need to restart the host to rescan for newly presented virtual disks.

Sample output from a rescan

The following is a sample output from an ioscan command:

```
# ioscan -fnCdisk
```

| Class | I H/W Patch | Driver | S/W State | H/W Type | Description |
|---------|----------------------------|--------|-----------|-----------|---|
| ba | 3 0/6 | lba | CLAIMED | BUS_NEXUS | Local PCI Bus Adapter (782) |
| fc | 2 0/6/0/0 | td | CLAIMED | INTERFACE | HP Tachyon XL@ 2 Fibre Channel Mass Storage Adapter |
| | | | | | /dev/td2 |
| fc | 0 0/6/0/0.39 | fc | CLAIMED | INTERFACE | FCP Domain |
| ext_bus | 4 0/6/00.39.13.0.0 | fc | CLAIMED | INTERFACE | FCP Array Interface |
| target | 5 0/6/0/0.39.13.0.0.0 | tgt | | CLAIMED | DEVICE |
| ctl | 4 0/6/0/0.39.13.0.0.0.0 | sctl | CLAIMED | DEVICE | HP HSV210 |
| | | | | | /dev/rscsi/c4t0d0 |
| disk | 22 0/6/0/0.39.13.0.0.0.1 | sdisk | CLAIMED | DEVICE | HP HSV210 |
| | | | | | /dev/dsk/c4t0d1 |
| ext_bus | 5 0/6/0/0.39.13.255.0 | fc | CLAIMED | INTERFACE | FCP Device Interface |
| target | 8 0/6/0/0.39.13.255.0.0 | tgt | | CLAIMED | DEVICE |
| ctl | 20 0/6/0/0.39.13.255.0.0.0 | sctl | CLAIMED | DEVICE | HP HSV210 |
| | | | | | /dev/rscsi/c5t0d0 |
| ext_bus | 10 0/6/0/0.39.28.0.0 | fc | CLAIMED | INTERFACE | FCP Array Interface |
| target | 9 0/6/0/0.39.28.0.0.0 | tgt | | CLAIMED | DEVICE |
| ctl | 40 0/6/0/0.39.28.0.0.0.0 | sctl | CLAIMED | DEVICE | HP HSV210 |
| | | | | | /dev/rscsi/c10t0d0 |
| disk | 46 0/6/0/0.39.28.0.0.0.2 | sdisk | CLAIMED | DEVICE | HP HSV210 |
| | | | | | /dev/dsk/c10t0d2 |
| disk | 47 0/6/0/0.39.28.0.0.0.3 | sdisk | CLAIMED | DEVICE | HP HSV210 |
| | | | | | /dev/dsk/c10t0d3 |
| disk | 48 0/6/0/0.39.28.0.0.0.4 | sdisk | CLAIMED | DEVICE | HP HSV210 |
| | | | | | /dev/dsk/c10t0d4 |
| disk | 49 0/6/0/0.39.28.0.0.0.5 | sdisk | CLAIMED | DEVICE | HP HSV210 |
| | | | | | /dev/dsk/c10t0d5 |
| disk | 50 0/6/0/0.39.28.0.0.0.6 | sdisk | CLAIMED | DEVICE | HP HSV210 |
| | | | | | /dev/dsk/c10t0d6 |
| disk | 51 0/6/0/0.39.28.0.0.0.7 | sdisk | CLAIMED | DEVICE | HP HSV210 |
| | | | | | /dev/dsk/c10t0d7 |

View the `ioscan` and `insf` man pages for more information on using these commands.

If you are unable to access the virtual disk, check the following items:

- Verify all cabling to the switch, Enterprise Virtual Array, and host.
- Verify all firmware levels (check the Enterprise Virtual Array QuickSpecs and associated release notes for details).
- Ensure that you are running a supported version of the host operating system. For more information, see the host specific release notes.
- Ensure that HP-UX is selected as the operating system for the virtual disk in the Command View EVA.

Configuring virtual disks from the host

After you set up the virtual disks on the Enterprise Virtual Array and have rescanned or restarted the host, follow the host-specific conventions for configuring these new disk resources. Refer to the documentation that came with your server for specific instructions on setting up disk resources.

The operating system treats an HSV110 virtual disk much like a SCSI disk. Therefore, you can use logical Volume Manager (LVM) commands `pvcreate`, `vgcreate`, and `lvcreate` to manually add the virtual disk LUN to the host. The following is an example of manually adding a virtual disk LUN to the host:

- Create the physical volume on the virtual disk using `pvcreate`.
- Create the directory on the virtual disk using `mkdir`.
- Create the node on the virtual disk using `mknod`.
- Create the volume group on the virtual disk using `vgcreate`.
- Create the logical volume on the virtual disk using `lvcreate`.
- Create a file system on the virtual disk.
- Mount the file system (to gain access to the virtual disk).

Creating volume groups on a virtual disk using `vgcreate`

Create a volume group on a virtual disk by issuing a `vgcreate` command. In order for HP-UX to access the virtual disk, the `vgcreate` command builds the virtual group block data. In addition, refer to the `pvcreate`, `vgcreate`, and `lvcreate` man pages for more information about creating disks and file systems. Use the following procedure to create a volume group on a virtual disk:

1. Create the physical volume on a virtual disk by entering a command similar to the following:

```
# pvcreate -f /dev/rdisk/c32t0d1
```
2. Create the volume group directory for a virtual disk by entering a command similar to the following:

```
# mkdir /dev/vg01
```

The designation `vg01` is an example. Use a unique designation for each volume group you create.
3. Create the volume group node for a virtual disk, by entering a command similar to the following:

```
# mknod /dev/vg01/group c 64 0x010000
```

The designation `64` is the major number that equates to the 64-bit mode.
The `0x01` is the minor number in hex, which must be unique for each volume group.
4. Create the volume group for a virtual disk by entering a command similar to the following:

```
# vgcreate -f /dev/vg01 /dev/dsk/c32t0d1
```
5. Create the logical volume for a virtual disk by entering a command similar to the following:

```
# lvcreate -L1000 /dev/vg01/lvol1
```

In this example, a 1-GB logical volume (`lvol1`) is created.

6. Create a file system for the new logical volume by creating a file system directory name and inserting a mount tap entry into `/etc/fstab`.
7. Run `mkfs` on the new logical volume. The new file system is ready to mount.

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